REMARKS

Claims 1-19 are pending of which Claims 1-4, 10, 17, and 19 were rejected and Claims 5-9, 11-13, and 18 were objected to. Claims 14-16 were indicated as allowable. Applicant respectfully requests reconsideration.

The Examiner is thanked for his time and consideration in today's conversation regarding this application. Applicants note that the office action of December 31, 2002, is the second non-final Office Action and that the next office action will be the third substantive Office Action. In light of the today's conversation with the Examiner, Applicant respectfully refers to MPEP §707.02, which states that "the shortest path to the final disposition of an application is by finding the best references on the first search and carefully applying them."

Claim Rejections – 35 U.S.C. §103

Claims 1-4, 10, 17, and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kaisaki et al. (US 6,194,317 B1) ("Kaisaki") in view of McWaid et al. (US 2002/0174714 A1) ("McWaid"). Applicant respectfully traverses.

In regards to Claim 1, neither Kaisaki nor McWaid teach or suggest "correlating the height variation of said first feature with said calibration data to determine the amount of dishing of said first feature". Further, Applicant submits that neither Kaisaki nor McWaid teach or suggest "generating a set of calibration data"

Specifically, the Examiner is apparently citing Kaisaki as teaching "correlating the height variation of said first feature with said calibration data to determine the amount of dishing of said first feature." The Examiner stated Kaisaki discloses "measuring the height variation of a first feature on a substrate (column 36, lines 17-19), which would inherently correlate the height variation of the first feature with the height of the second feature to determine the amount of dishing of said first feature, this being reasonably assumed from the data of Table 5...." (Emphasis added). Applicant respectfully disagrees.

The Examiner noted himself that Kaisaki does not disclose the calibration data. Accordingly, Kaisaki cannot teach or suggest "correlating the height variation of said first feature with said calibration data" as recited in Claim 1.

Moreover, Applicant notes that the Examiner's rejection relies on statements such as "would inherently correlate" and "being reasonably assumed". Applicant submits that the Examiner's assumption relating to the inherency of the scope of the disclosure in Kaisaki is

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improper. Applicant can find no discussion, either explicit or implicit, in Kaisaki of correlating the measured height variation of one feature to dishing. Applicant submits that the Examiner is using knowledge gleaned from the present application as the basis for his assumptions of the scope of the disclosure of Kaisaki, which is classic, but impermissible, hindsight reconstruction.

Specifically, the Examiner stated that "this being reasonably assumed from the data of Table 5". Kaisaki states at col. 36, lines 13-30:

> Article 10 was tested according to the Test Procedure II, and the profile of the 100 micron square features on the wafer were measured to determine the extent of dishing in areas on the which had copper removed to expose the silicon dioxide stop layer. The Tencor P-22 profilometer was used to measure the dishing. Six different sites on the wafer were measured. The measurements are reported in Table 5.

TABLE 5

Site	Dishing (TIR, Å)
1	2957
2	1174
3	2288
4	3504
5	3271
6	2256

The data provided in Table 5 is simply the results from the conventional profilometer measurement at six different sites on the wafer. There is no reason to assume that this data inherently discloses a correlation of a height variation of the first feature with the height of the second feature to determine the amount of dishing of said first feature. Moreover, the Examiner failed to provide any explanation of his cited reasonable assumption.

As for "generating a set of calibration data", the Examiner stated that such a limitation would be obvious "since MCWAID et al teaches that measuring the height of a surface at several sampling locations provides a quick measurement of the height of the surface." The Examiner cited page 2, section [0011], lines 9-13. Applicant respectfully disagrees.

In general, McWaid is related to measuring a sample surface using a profilometer by repeatedly contacting the sample at different locations, where the sensing tip and sample are

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not moved laterally with respect to each other when in contact. See, e.g., paragraph 0008. McWaid notes that a number of techniques may be employed to assure that that sensing tip and the sample are sufficiently separated during lateral movement, one of which is actually measuring the height of the surface at several locations. One of these techniques is discussed at page 2, section [0011], lines 9-13, in which McWaid states, "[i]f the height information of the sample surface or a portion thereof is not readily available, such information can be acquired quickly by actually measuring the height of the surface at several sampling locations." Thus, McWaid is teaching that the height measurement operation is actually performed at several locations. McWaid does not discuss calibration data.

Thus, Applicant submits that McWaid's "actually measuring the height surface at several sampling locations" neither teaches nor suggests "generating a set of calibration data" or "correlating the height variation of said first feature with said calibration data to determine the amount of dishing of said first feature" as recited in Claim 1.

Applicant submits that if Kaisaki and McWaid were combined, the result would be performing a conventional profilometer measurement, as taught in Kaisaki, while "actually measuring the height surface at several sampling locations" as taught in McWaid. Accordingly, Applicant respectfully submits that the Examiner has not made a prima facie case of obviousness, as neither Kaisaki nor McWaid, alone or together teach or suggest "generating a set of calibration data" or "correlating the height variation of said first feature with said calibration data to determine the amount of dishing of said first feature".

In addition, Applicant respectfully point out that the Examiner has failed to provide a motivation to combine Kaisaki with McWaid. The Examiner only stated that "it would have been obvious ... for the method of Kaisaki et al to comprise generating a set of calibration data for height variation correlation since MCWAID et al teaches that measuring the height of a surface at several sampling locations provides a quick measurement of the height of the surface." There is no discussion of the motivation to combine the two references. Moreover, Applicant asserts that no motivation exists.

Thus, Applicant respectfully submits that Claim 1 is patentable over the combination of Kaisaki and McWaid. Reconsideration and withdrawal of this rejection is respectfully requested. Claims 2-13 depend from Claim 1 and are, therefore, likewise patentable.

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Regarding Claim 17, the Examiner's rejection relies upon Kaisaki and McWaid as discussed in Claim 1. The Examiner stated that Kaisaki discloses "inherently comparing said height variation of said first feature with the height of said second feature, which relates the magnitude of dishing to the profile shape of a first feature, the being reasonably assumed from the data of table 5 ...." The Examiner noted that Kaisaki does not specifically disclose "pre-generated calibration data" but relies on McWaid, page 2, section [001], lines 9-13, for this. Applicant respectfully requests reconsideration and withdrawal of the rejection.

Independent Claim 17 recites "comparing said height variation of said first feature with pre-generated calibration data that relates the magnitude of dishing to the profile shape of a first feature." As noted by the Examiner, Kaisaki does not disclose "pre-generated calibration data that relates the magnitude of dishing to the profile shape of a first feature". Moreover, as discussed above, McWaid discloses actually performing the measurement operation, but does not teach or suggest "pre-generated calibration data". Further, McWaid is not related to dishing, and thus does not or suggest "pre-generated calibration data that relates the magnitude of dishing to the profile shape of a first feature".

Accordingly, as discussed above, neither Kaisaki nor McWaid teach or suggest "pre-generated calibration data that relates the magnitude of dishing to the profile shape of a first feature" nor do they teach or suggest "comparing said height variation of said first feature with pre-generated calibration data ...."

Thus, Applicant respectfully submits that Claim 17 is patentable over the combination of Kaisaki and McWaid. Reconsideration and withdrawal of this rejection is respectfully requested. Claims 18-19 depend from Claim 17 and are, therefore, likewise patentable.

For the above reasons, Applicant respectfully requests allowance of Claims 1-19. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 982-8200, ext. 2.

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Respectfully submitted,

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Inventors:	Jaime Poris
Assignee:	Nanometrics Incorporated
Title:	Method of Measuring Dishing
Application No.:	09/578,798
Examiner:	William C. Choi
Atty Docket No.:	NAN040 US

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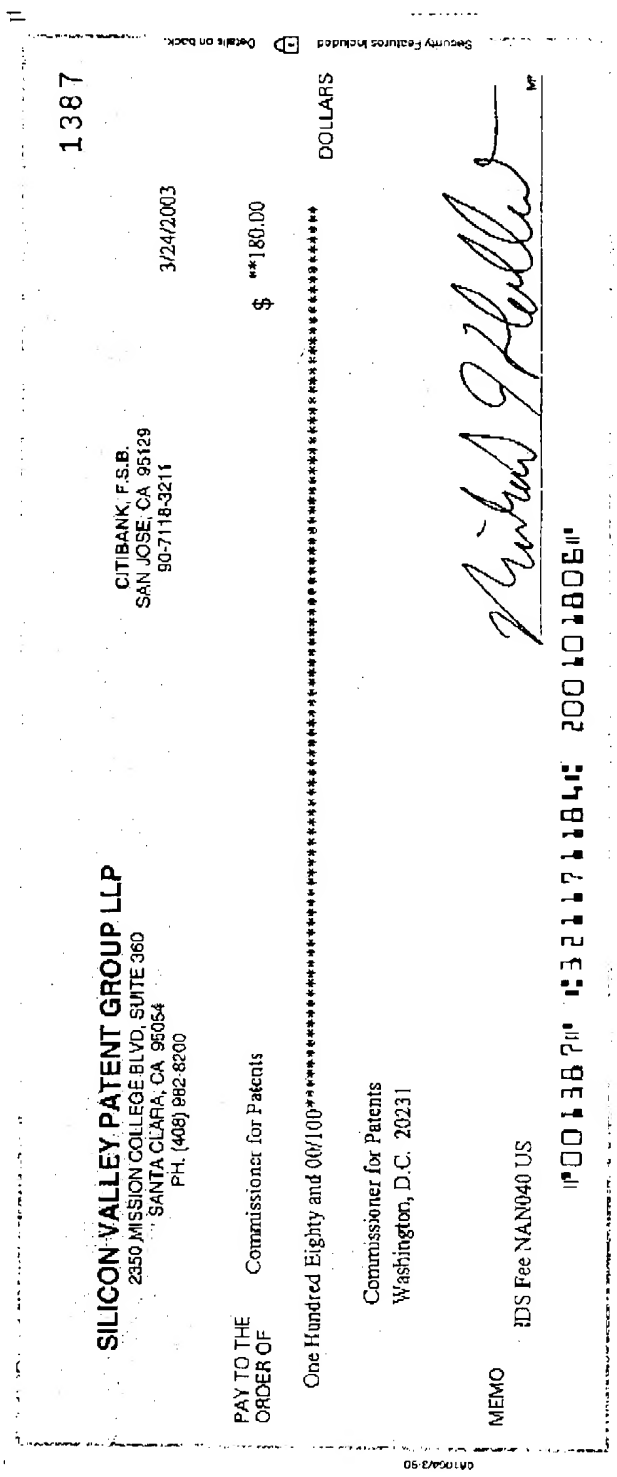

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